

(12) **United States Patent**
Lu et al.

(10) **Patent No.:** **US 9,237,065 B2**
(45) **Date of Patent:** **Jan. 12, 2016**

(54) **CHIP AND COMPUTER SYSTEM**

(71) Applicant: **Nuvoton Technology Corporation,**
Hsinchu (TW)

(72) Inventors: **Chia-Ching Lu,** Hsinchu (TW);
Hsi-Jung Tsai, Hsinchu (TW)

(73) Assignee: **Nuvoton Technology Corporation,**
Hsinchu (TW)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/221,299**

(22) Filed: **Mar. 21, 2014**

(65) **Prior Publication Data**

US 2014/0207961 A1 Jul. 24, 2014

Related U.S. Application Data

(63) Continuation-in-part of application No. 13/193,622,
filed on Jul. 29, 2011, now Pat. No. 8,725,917.

(30) **Foreign Application Priority Data**

Sep. 16, 2010 (CN) 2010 1 0287168

(51) **Int. Cl.**
G06F 11/32 (2006.01)
H04L 12/24 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC **H04L 41/046** (2013.01); **G06F 11/2284**
(2013.01); **G06F 11/3031** (2013.01); **G06F**
11/3041 (2013.01); **G06F 11/3055** (2013.01);
(Continued)

(58) **Field of Classification Search**

CPC H04L 29/08576; H04L 29/08072;

H04L 29/0809; H04L 29/06095; H04L 29/06;
H04L 41/046; G06F 11/2284; G06F 11/3031;
G06F 11/3041; G06F 11/3055; G06F 11/3058;
G06F 11/32

USPC 709/227
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,920,355 A * 7/1999 Kim H04N 5/44504
348/564
5,990,940 A 11/1999 Hashimoto et al.
6,037,978 A 3/2000 Kim

(Continued)

FOREIGN PATENT DOCUMENTS

TW 561334 B 11/2003
TW 200825726 6/2008

(Continued)

Primary Examiner — Farley Abad

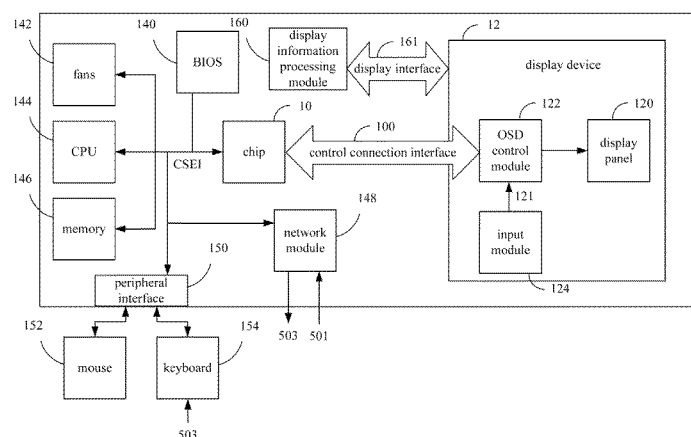
(74) *Attorney, Agent, or Firm* — CKC & Partners Co., Ltd.

(57) **ABSTRACT**

A computer system is provided. The computer system comprises a network module and an input device. The network module receives remote information from a remote host through a network. The input device receives first input information, a display device and a chip. The display device comprises a display panel and an on-screen display (OSD) control module. The chip comprises a control connection interface and a control module. The control connection interface is electrically connected to the OSD control module. The control module is electrically connected to the network module, the input device and the control connection interface to control the OSD control module through the control connection interface according to the remote information or the first input information to further control the display function of the display panel.

22 Claims, 9 Drawing Sheets

1



- (51) **Int. Cl.** 725/37
G06F 11/22 (2006.01) 2007/0004270 A1 1/2007 Kim et al.
G06F 11/30 (2006.01) 2007/0168763 A1 7/2007 Sauber et al.
(52) **U.S. Cl.** 2009/0027555 A1* 1/2009 Hanko et al. 348/569
CPC **G06F 11/3058** (2013.01); **G06F 11/328** 2009/0172443 A1* 7/2009 Rothman et al. 713/323
(2013.01) 2010/0037079 A1 2/2010 Nieh et al.
2010/0194996 A1* 8/2010 Vergoossen 348/725

(56) **References Cited**

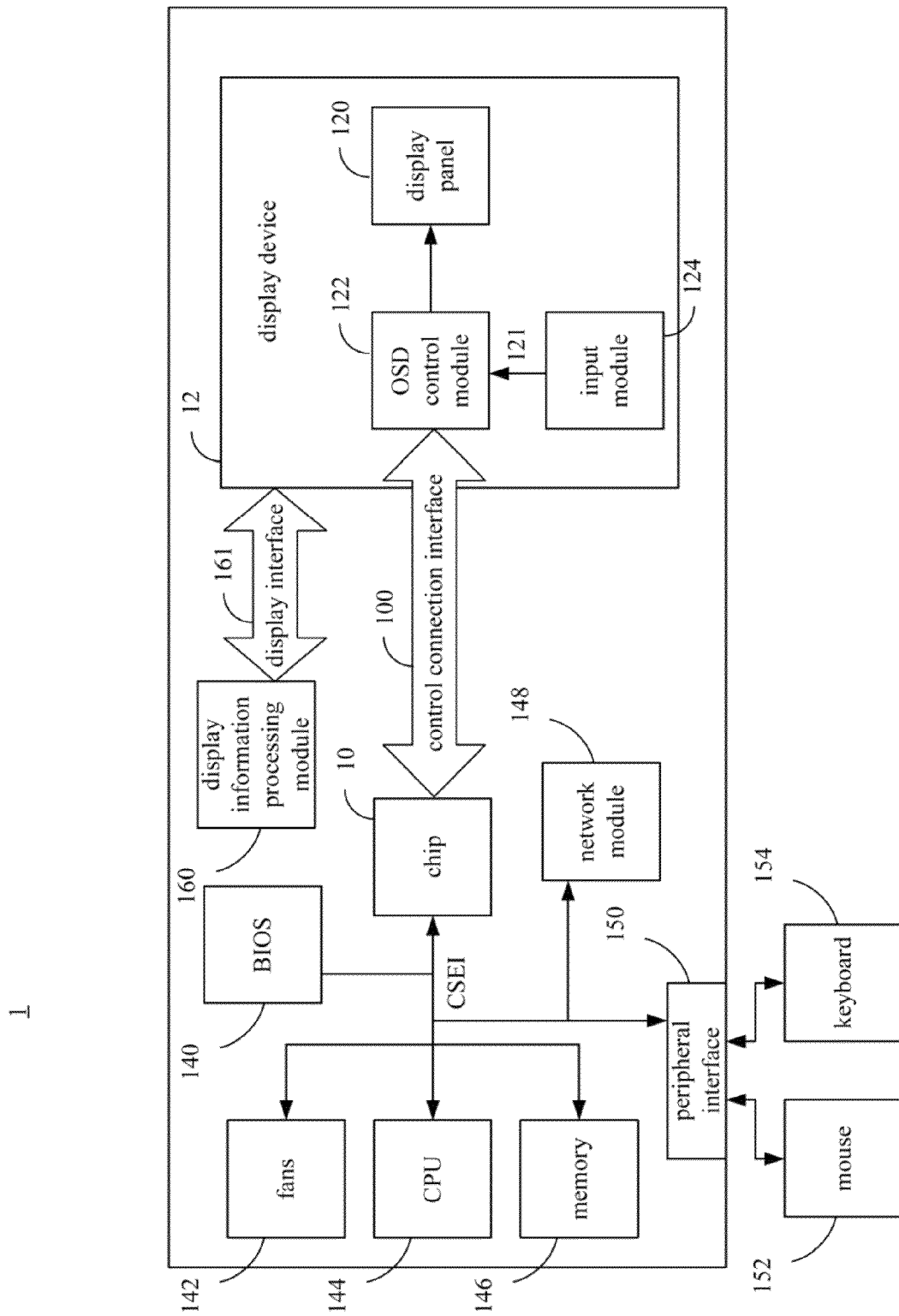
FOREIGN PATENT DOCUMENTS

U.S. PATENT DOCUMENTS

6,263,396 B1* 7/2001 Cottle et al. 710/263
6,845,277 B1 1/2005 Michelet et al.
2003/0014751 A1* 1/2003 Paek H04N 5/9201
725/30
2006/0064716 A1* 3/2006 Sull G06F 17/30793

TW 200917018 4/2009
TW 200921367 5/2009
TW 200949700 12/2009
TW 200951708 A 12/2009
WO WO2010024626 A2 3/2010

* cited by examiner



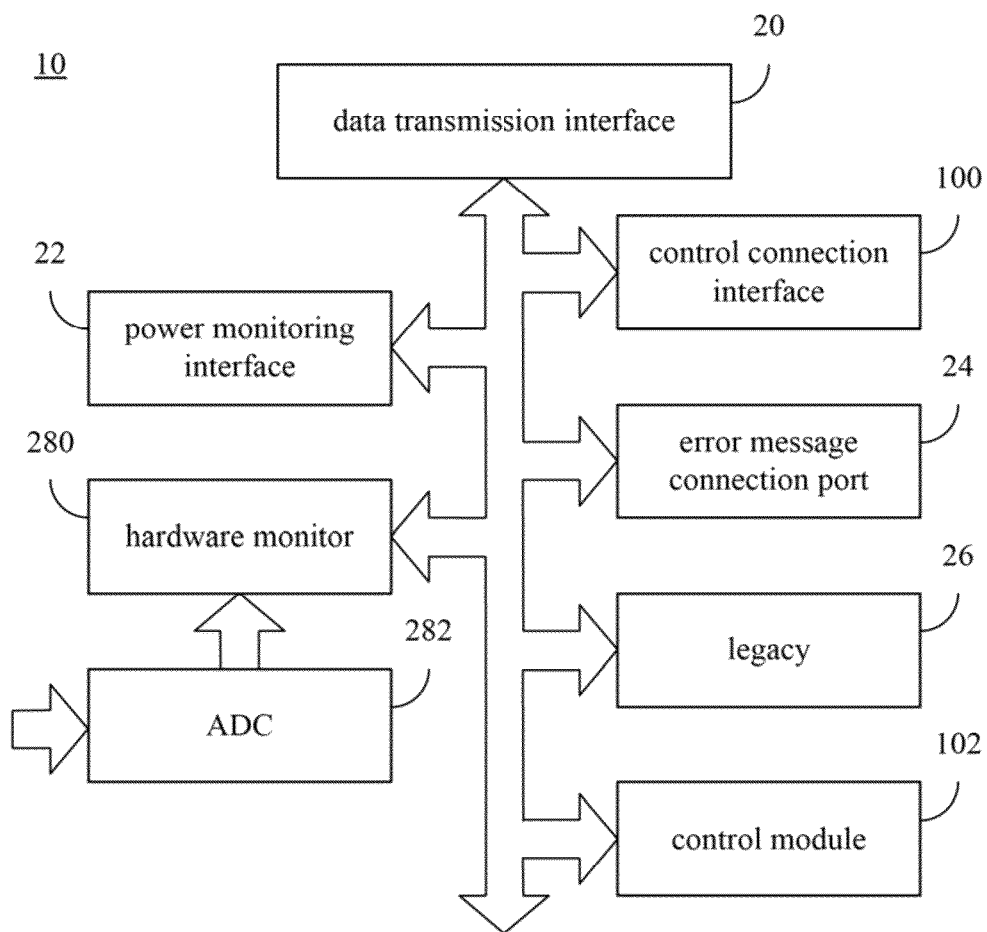


Fig. 2

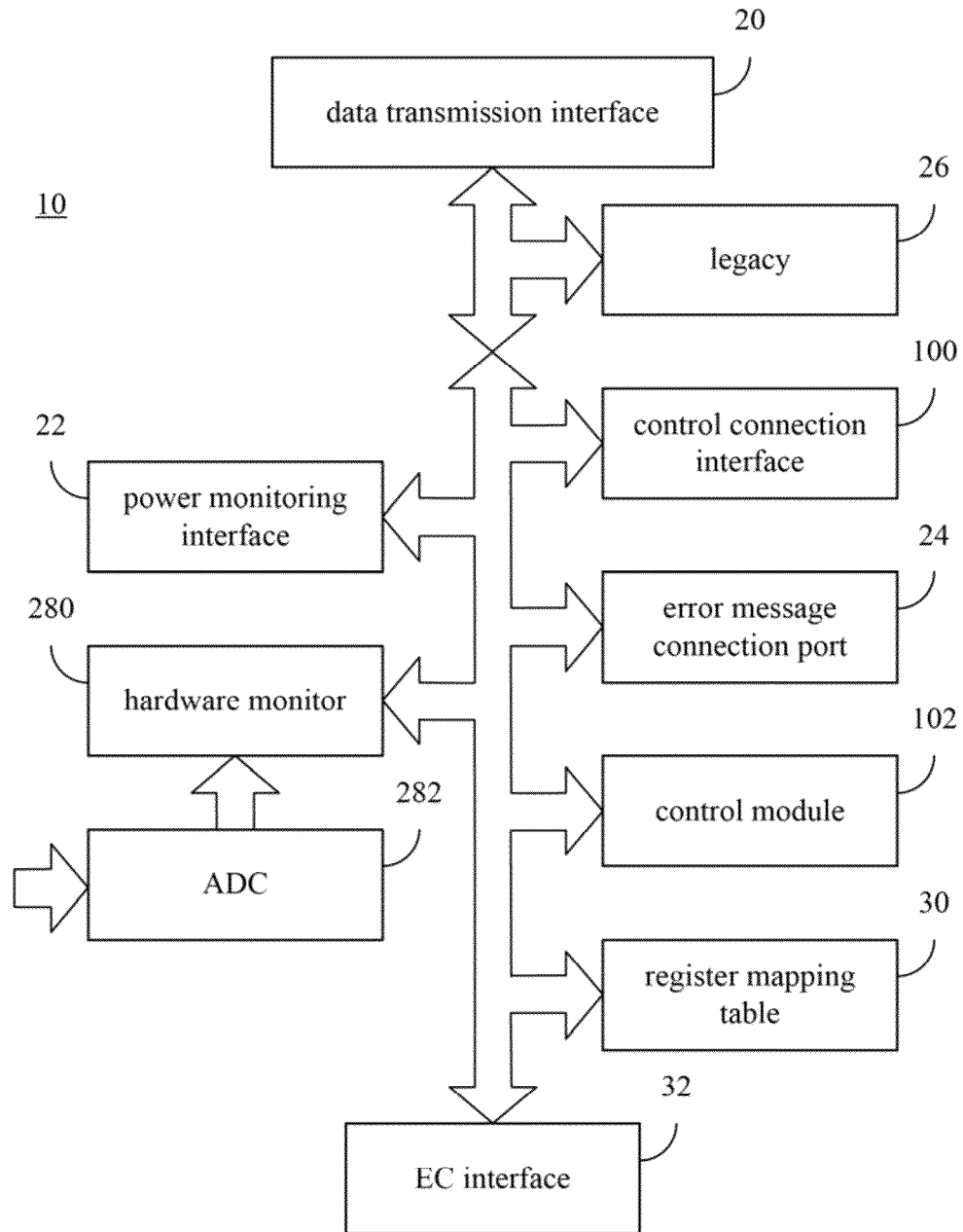


Fig. 3

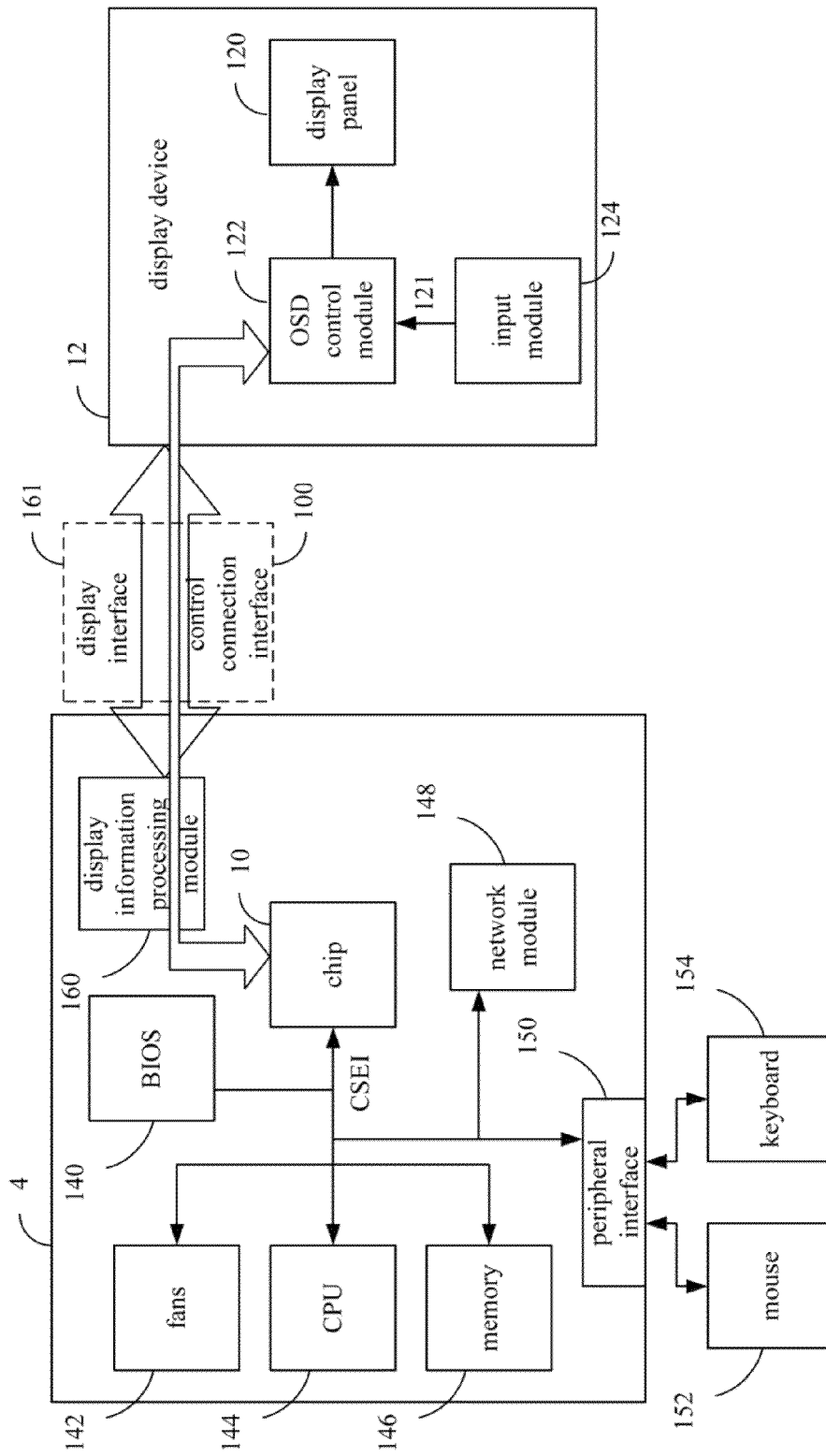


Fig. 4

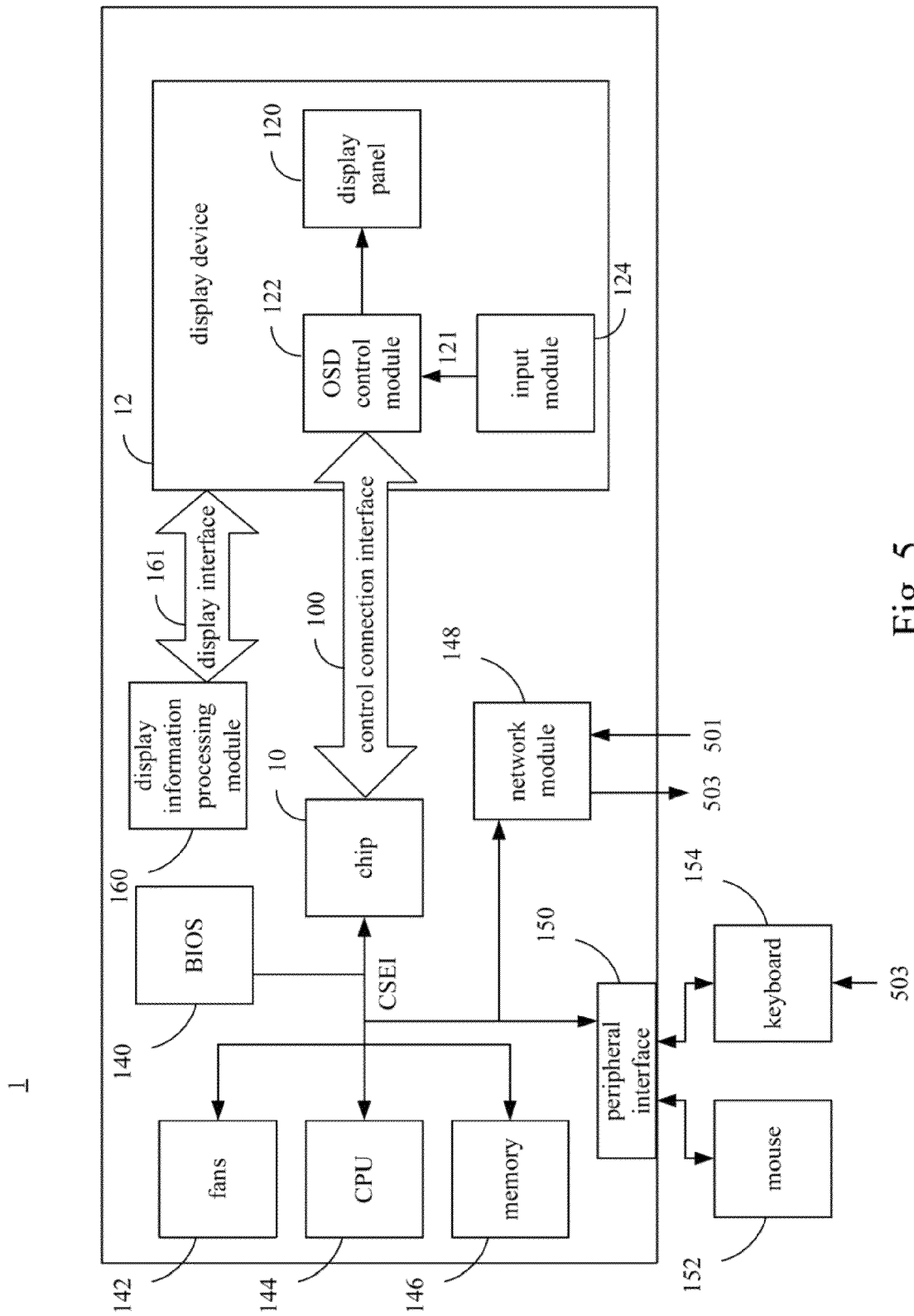


Fig. 5

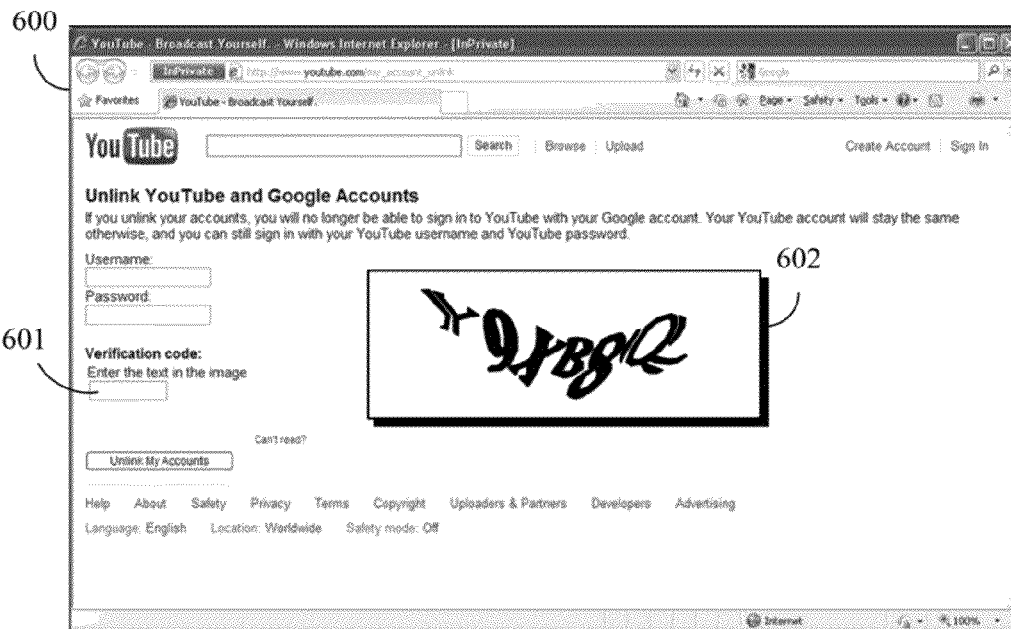


Fig. 6

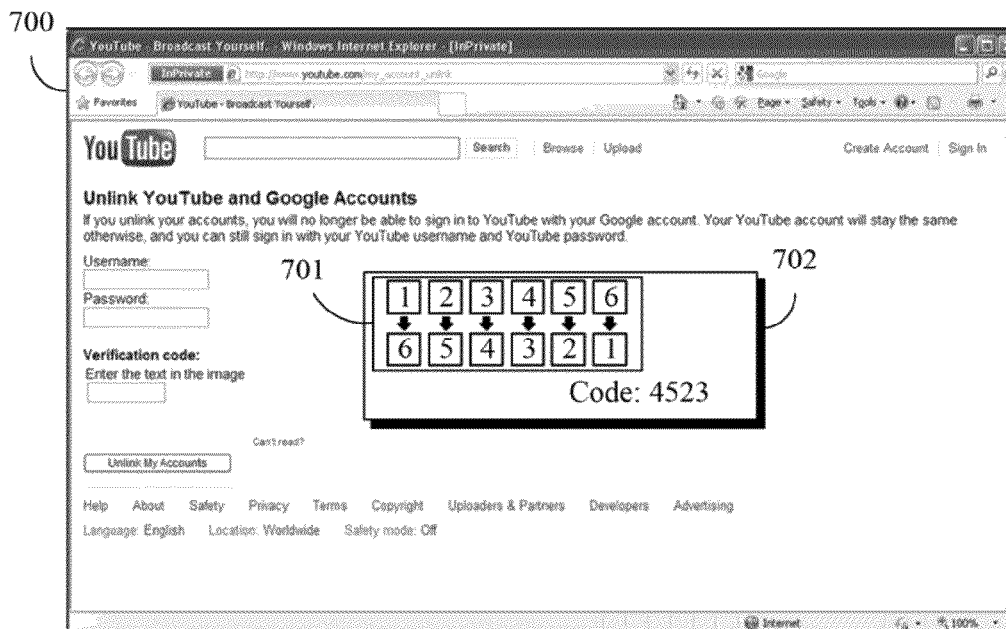


Fig. 7

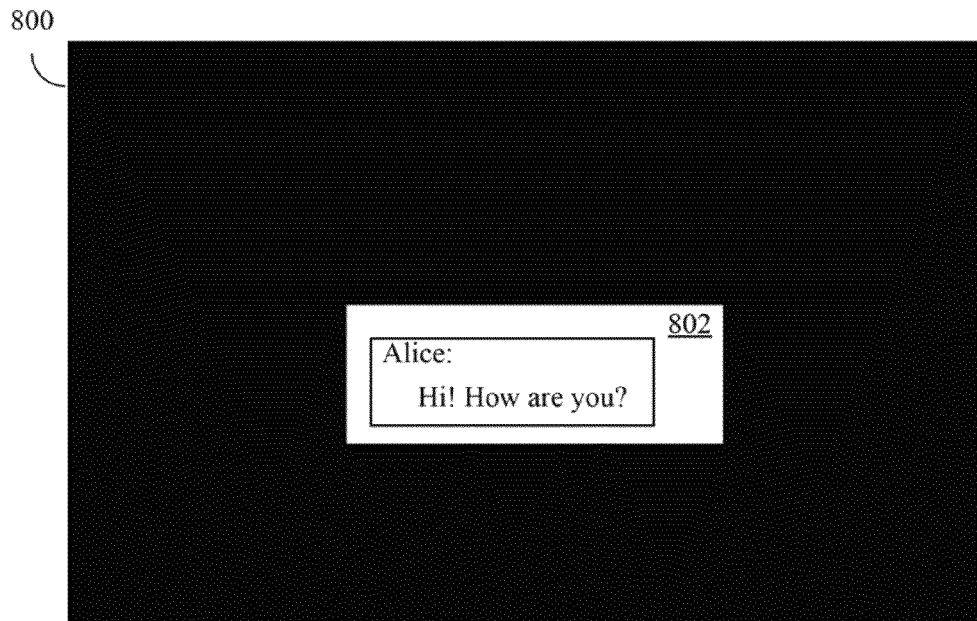


Fig. 8

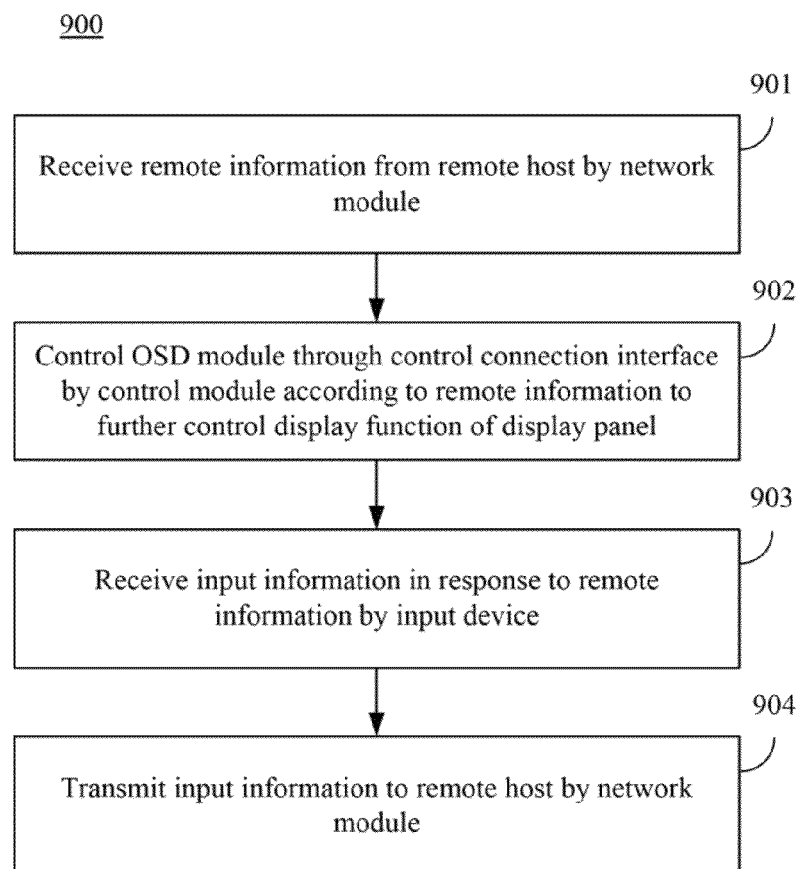
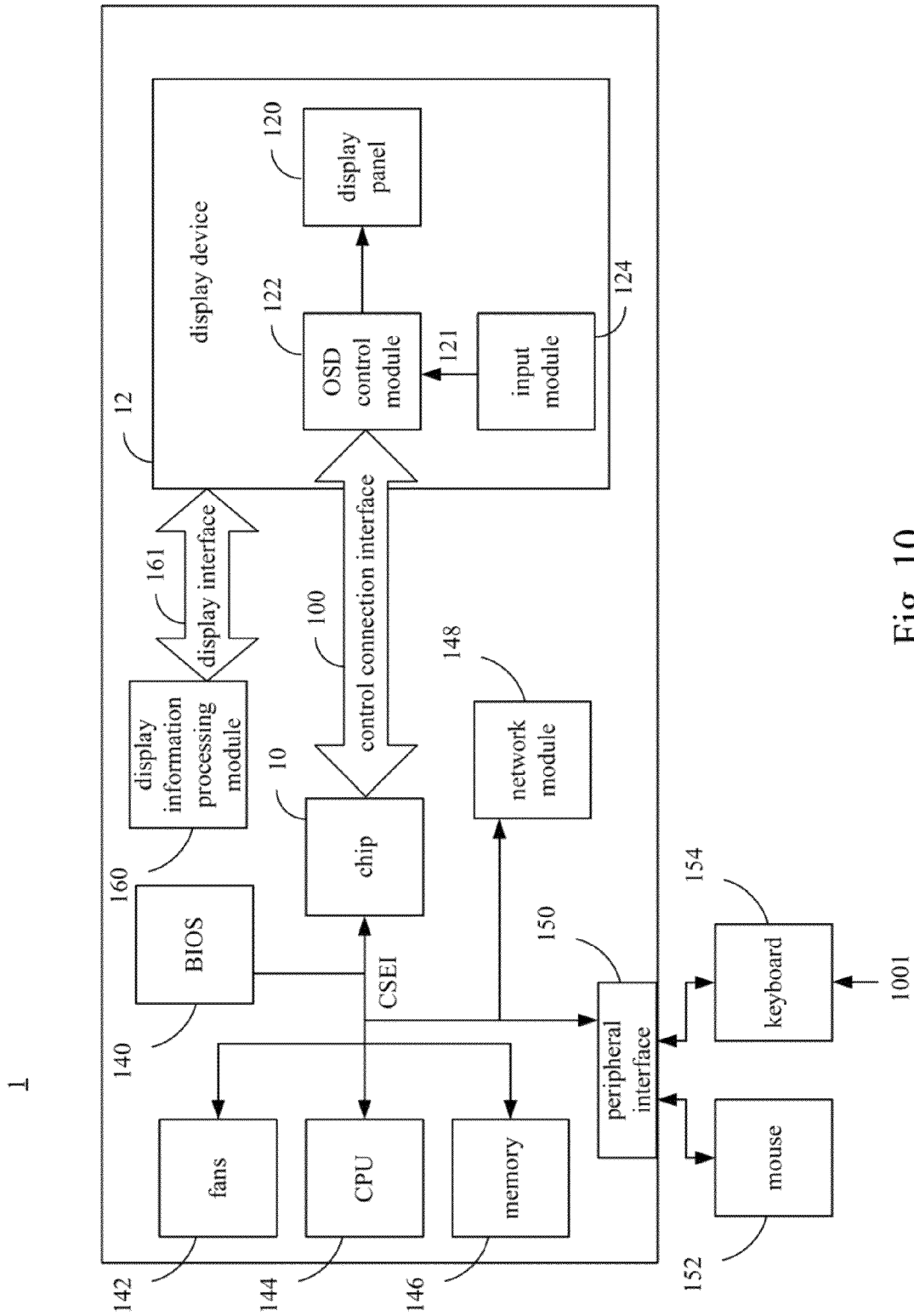


Fig. 9



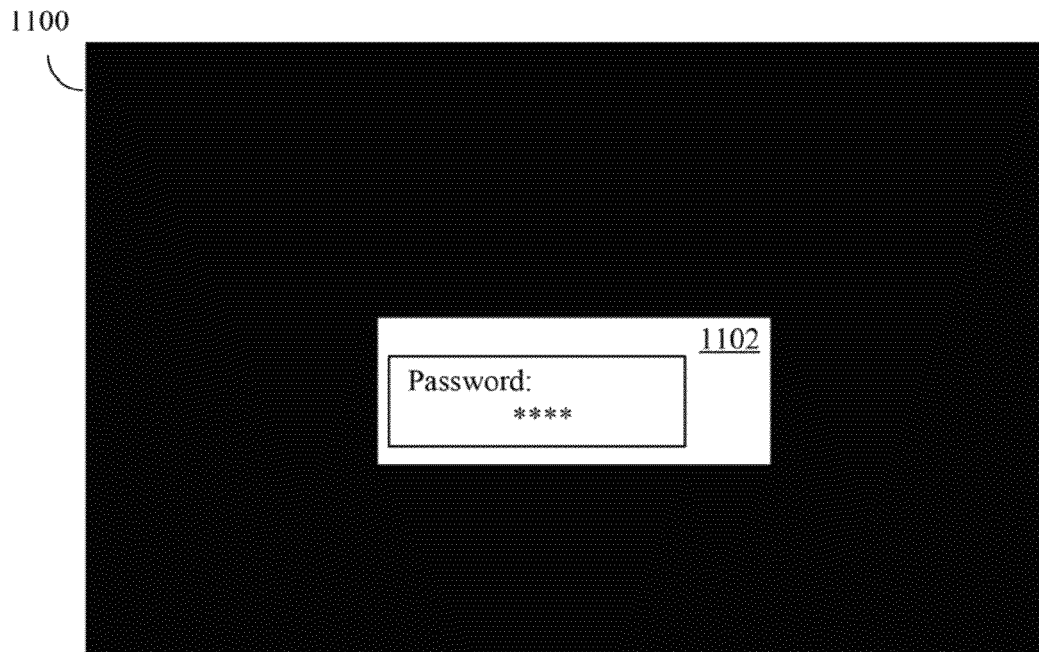


Fig. 11

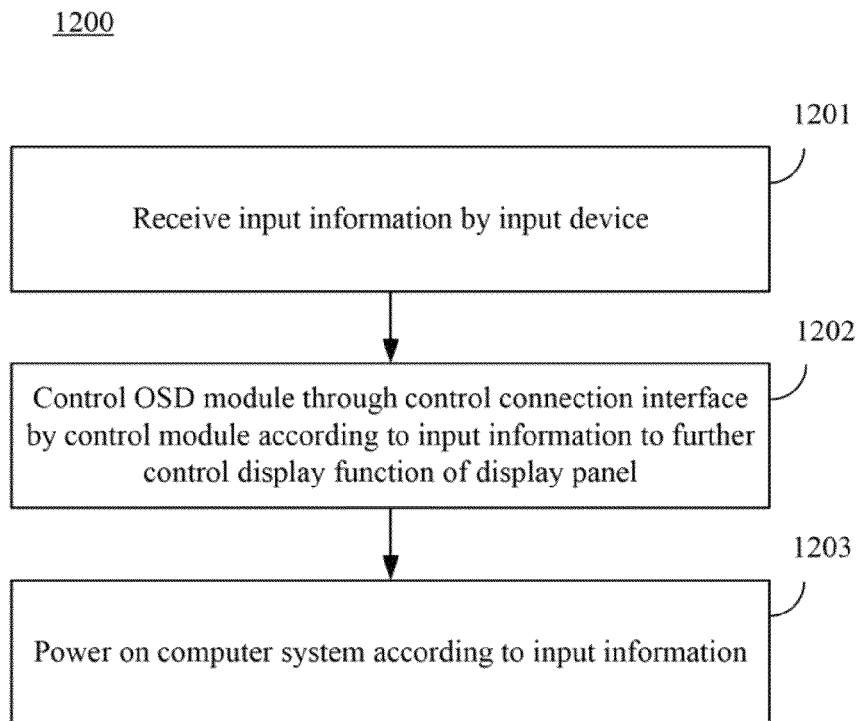


Fig. 12

1

CHIP AND COMPUTER SYSTEM**RELATED APPLICATIONS**

This application is a Continuation-in-part of U.S. application Ser. No. 13/193,622, filed on Jul. 29, 2011, which claims priority of Chinese Patent Application No. 201010287168.7, filed on Sep. 16, 2010, the entirety of which is herein incorporated by reference.

BACKGROUND**1. Technical Field**

The present disclosure relates to an electronic device. More particularly, the present disclosure relates to a computer system and a chip having a computer system environment information monitoring module.

2. Description of Related Art

Input/output interfaces are the device by which users interact with a computer system. The computer system often makes use of a screen as an output device to present the information to the user. Usually, a display card, such as a video card, a graphics card or a graphics-accelerator card, is needed to process the information to generate output images on the screen. However, the users are not able to receive the information when the display card malfunctions or when the information is generated before the activation of the display card. Thus, the users cannot figure out the status of the computer when the above situations occur.

SUMMARY

An aspect of the present disclosure is to provide a computer system. The computer system comprises a network module, an input device, a display device and a chip. The network module receives remote information from a remote host through a network. The input device receives first input information. The display device comprises a display panel and an OSD control module for controlling a display function of the display panel. The chip comprises a control connection interface and a control module. The control connection interface is electrically connected to the OSD control module. The control module is electrically connected to the network module and the input device and the control connection interface to control the OSD control module through the control connection interface according to the remote information or the first input information to further control the display function of the display panel.

Another aspect of the present disclosure is to provide a method used in an electronic system. The method includes the steps outlined below. Remote information is received by a network module from a remote host through a network or first input information is received by an input device. A OSD control module is controlled through the control connection interface electrically connected to the OSD control module by a control module electrically connected to the network module and the input device according to the remote information or the first input information to further control a display function of a display panel.

Yet another aspect of the present invention is to provide a chip adapted in an electronic system. The chip comprises a control connection interface and a control module. The control connection interface is electrically connected to an OSD control module. The control module is electrically connected to a network module and an input device, for receiving remote information from a remote host through the network module, and receiving first input information through the input device,

2

wherein the control module control the OSD control module through the control connection interface according to the remote information or the first input information to further control the display function of a display panel.

It is to be understood that both the foregoing general description and the following detailed description are by examples, and are intended to provide further explanation of the disclosure as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure can be more fully understood by reading the following detailed description of the embodiments, with reference made to the accompanying drawings as follows:

FIG. 1 is a block diagram of a computer system of an embodiment of the present disclosure;

FIG. 2 is a detailed block diagram of the chip depicted in FIG. 1;

FIG. 3 is a detailed block diagram of the chip in another embodiment of the present disclosure;

FIG. 4 is the block diagram of the computer system in another embodiment of the present disclosure;

FIG. 5 is a block diagram of the computer system of an embodiment of the present disclosure;

FIG. 6 is a diagram of a first frame and a second frame displayed by the display panel in an embodiment of the present disclosure;

FIG. 7 is a diagram of a first frame and a second frame displayed by the display panel in an embodiment of the present disclosure;

FIG. 8 is a diagram of a first frame and a second frame displayed by the display panel in an embodiment of the present disclosure;

FIG. 9 is a flow chart of a computer system operation method in an embodiment of the present disclosure;

FIG. 10 is a block diagram of the computer system of an embodiment of the present disclosure;

FIG. 11 is a diagram of a first frame and a second frame displayed by the display panel in an embodiment of the present disclosure; and

FIG. 12 is a flow chart of a computer system operation method in an embodiment of the present disclosure.

DETAILED DESCRIPTION

In the following description, several specific details are presented to provide a thorough understanding of the embodiments of the present invention. One skilled in the relevant art will recognize, however, that the present invention can be practiced without one or more of the specific details, or in combination with or with other components, etc. In other instances, well-known implementations or operations are not shown or described in detail to avoid obscuring aspects of various embodiments of the present invention.

The terms used in this specification generally have their ordinary meanings in the art and in the specific context where each term is used. The use of examples anywhere in this specification, including examples of any terms discussed herein, is illustrative only, and in no way limits the scope and meaning of the invention or of any exemplified term. Likewise, the present invention is not limited to various embodiments given in this specification.

As used herein, the terms “comprising,” “including,” “having,” “containing,” “involving,” and the like are to be understood to be open-ended, i.e., to mean including but not limited to.

Reference throughout the specification to “one embodiment” or “an embodiment” means that a particular feature, structure, implementation, or characteristic described in connection with the embodiment is included in at least one embodiment of the present invention. Thus, uses of the phrases “in one embodiment” or “in an embodiment” in various places throughout the specification are not necessarily all referring to the same embodiment. Furthermore, the particular features, structures, implementation, or characteristics may be combined in any suitable manner in one or more embodiments.

Please refer to FIG. 1. FIG. 1 is a block diagram of a computer system 1 of an embodiment of the present disclosure. The computer system 1 comprises a chip 10, a display device 12 and a plurality of system and peripheral hardware devices.

The display device 12 comprises a display panel 120 and an OSD control module 122 for controlling a display function of the display panel 120. An input module 124, such as the buttons disposed on the display device 12, can be used to activate the OSD control module 122 to perform the controlling mechanism. The OSD control module 122 is able to display the basic information of the display device 12 and provide an adjusting interface for the display device 12. For example, the user can activate the OSD control module 122 to show a function table on the display panel 120 by using the input module 124 to adjust, for example, the brightness, the contrast or the frame position of the display panel 120. In different embodiments, the OSD control module 122 can be integrated with parts of the modules such as LCD controller, scalar or power control module into a single monitor IC or into a number of different chips.

The system and peripheral hardware devices of the computer system 1 may comprise a BIOS 140, fans 142, a CPU 144, a memory 146, a network module 148, devices connected to the computer system 1 through the peripheral interface 150 such as a mouse 152 or keyboard 154 and a display information processing module 160.

The display information processing module 160 can be a display card such as a VGA (video graphics array) card or can be a display card with other specification (e.g. SVGA, XGA, SXGA, etc.). When the BIOS 140 of the computer system 1 finishes the initialization of the devices in the computer system 1, the user can operate the computer system 1 by the computer operation system. The information of the computer system 1 can be transmitted to the display device 12 by the display information processing module 160 through the display interface 161 to be displayed on the display panel 120.

Please refer to FIG. 2. FIG. 2 is a detailed block diagram of the chip 10. The chip 10 in the present embodiment is an SIO (super input/output) chip.

The chip 10 comprises a computer system environment information monitoring module, a control connection interface 100 and a control module 102. In the present embodiment, the computer system environment information monitoring module can be a data transmission interface 20, a power monitoring interface 22, an error message connection port 24, a legacy 26, a hardware monitor 280, an ADC (Analog to Digital Converter) 282 or a combination of the above function blocks (e.g. combination of two or more function blocks).

The data transmission interface 20 can be an LPC (low pin count) interface in an embodiment. The data transmission interface 20 and the legacy 26 can replace the conventional ISA (Industry Standard Architecture) transmission interface to provide a faster data transmission for part of the I/O devices, whereas the data transmission interface 20 further

communicates with the south bridge chipset (not shown) of the computer system 1. The power monitoring interface 22 can be an ACPI (Advanced Configuration and Power Interface) to control and manage the power of the computer system 1. For example, the power monitoring interface 22 can manage the power-on sequence and power-off sequence of the devices and provide a power management when the computer system not turned off properly.

The error message connection port 24 can be Port 80 in an embodiment to report the error message when a POST (Power-on Self Test) process is performed by the BIOS 140 shown in FIG. 1 during the initialization of the computer system 1. The ADC 282 is connected to a multiple of sensors (not shown) in the computer system 1, wherein the sensors can sense the hardware information such as, but not limited to, the temperature of the CPU 144, the speed of the fans 142 and the temperature and the voltage of the modules in the computer system 1. The ADC 282 converts the values sensed by the sensors into a specific format and transmits the data to the hardware monitor 280.

Consequently, the computer system environment information monitoring module comprising the data transmission interface 20, the power monitoring interface 22, the error message connection port 24, the legacy 26, the hardware monitor 280, the ADC 282 or a combination of the above function blocks can monitor a computer system environment information (abbreviated as CSEI in FIG. 1) of the computer system 1 according to the system and peripheral hardware devices described above.

For example, the computer system environment information retrieved by the system and peripheral hardware devices can be (but not limited to) the power information from the power monitoring interface 22, the system and peripheral hardware device self test result information from the error message connection port 24, the hardware system information received to the hardware monitor 280 from the ADC 282 according to the sensors such as the CPU information, the temperature information, the voltage information, the fan speed information and the information received to the data transmission interface 20 from the south bridge chipset such as the network ID, the CPU ID, the LAN connection status information or a combination of the above. It's noticed that, in an embodiment, the system and peripheral hardware device self test result information can be transmitted from the data transmission interface 20 directly to the control module 102 without the use of the error message connection port 24.

In other embodiments, the computer system environment information monitoring module can include other modules or can retrieve different computer system environment information.

The control connection interface 100 is electrically connected to the OSD control module 122. In an embodiment, the control connection interface 100 is a SMBus (System Management Bus) to communicate with the OSD control module 122. In an embodiment, the chip 10 can act as a master and the OSD control module 122 can act as a slave to communicate through the control connection interface 100. In other embodiments, other formats of bus interface such as SPI or I²C can be adapted to perform the communication if a proper design of the commands is accomplished.

The control module 102 is electrically connected to the computer system environment information monitoring module and the control connection interface 100 to control the OSD control module 122 through the control connection interface 100 according to the computer system environment information described above.

The control module 102 can control the OSD control module 122 according to the computer system environment information to control a display function of the display panel 120. In an embodiment, the control module 102 can transmit the computer system environment information to the OSD controller 122 such that the content of the computer system environment information can be displayed on the display panel 120.

The system information is not able to be displayed by the display information processing module 160 and the display interface 161 when the operation system or the display information processing module 160 of the computer system 1 is unable to be activated or is not activated yet, or when the display interface 161 is disconnected. Furthermore, when there is an error situation in the POST process performed by the BIOS 140 during the initialization of the computer system 1, the error message needs to be shown by additional LEDs on the motherboard, and the debug process has to be performed by an additional debug card, which are quite inconvenient.

The control module 102 in the present disclosure is able to control the OSD control module 122 through the control connection interface 100 to display the content of the computer system environment information monitored by the computer system environment information monitoring module of the chip 10 on the display panel 120. Therefore, the user can understand the status of the system or perform debug procedure according to the computer system environment information displayed by the OSD control module 122 on the display device 12 without any additional external module.

In an embodiment, the control module is able to control the OSD control module 122 to display a part of or all the content of the computer system environment information on the display panel 120 according to the input command 121 from the input module 124. The OSD control module 122 can display a function table to let the user determine the part of the computer system environment information to be displayed.

In another embodiment, the control module 102 controls the OSD control module 122 according to the computer system environment information to control a display state of the display panel 120, wherein the display state comprises a backlight brightness, a contrast, a color-related parameter, a frame position or a combination of the above. For example, when the control module 102 determines that the computer system 1 idles over a predetermined time period according to the computer system environment information, the control module 102 can lower the backlight brightness of the display panel 120 through the OSD control module 122 to save the power.

In yet another embodiment, the control module 102 controls a power-control module (not shown) of the display panel 120 through the OSD control module 122 according to the computer system environment information such that the power-control module lowers or turns off the power of the display panel 120 when the display panel 120 is in a standby mode and restores the power of the display panel 120 when the display panel 120 is back to a work mode.

In another embodiment, the control module 102 receives the input command 121 from the OSD control module 122 through the control connection interface 100 to accomplish a bi-directional communication and control mechanism between the chip 10 and the OSD control module 122.

When the peripheral I/O devices such as the mouse 152 or keyboard 154 cannot work properly, the control module 102 can control these peripheral I/O devices according to the input command 121. For example, the control module 102 can perform a debug process or a power-off control on the computer system 1 according to the input command 121. The

control module 102 can also turn off the computer system 1 through the power monitoring interface 22 according to the input command 121. On the other hand, when the display panel 120 can not show any information due to the malfunction of the display information processing module 160 and the display interface 161, the control module 102 can also control the computer system environment information monitoring module to retrieve related information according to the input command 121 to further send the related information to the OSD control module 122 through the control connection interface 100 to display the related information on the display panel 120. Thus, the bi-directional communication mechanism allows the chip 10 controlling the computer system 1 according to the input command 121 from the display device 12 when the I/O devices of the computer system 1 malfunction but the display device 12 operates as normal.

Please refer to FIG. 3. FIG. 3 is detailed block diagram of the chip 10 in another embodiment of the present disclosure. The chip 10 in the present embodiment can be an EC (embedded controller) chip.

In the present embodiment, the basic architecture of the chip 10 shown in FIG. 3 is similar to the chip shown in FIG. 2. The chip 10 shown in FIG. 3 comprises the control connection interface 100, the control module 102, the data transmission interface 20, the power monitoring interface 22, the error message connection port 24, the legacy 26, the hardware monitor 280 and the ADC (Analog to Digital Converter) 282. However, the chip 10 in the present embodiment further comprises a register mapping table 30 and an EC interface 32. In the present embodiment, the computer system environment information monitoring module can be the blocks (interface or module) described above or any combination of them.

The difference between the chip 10 with the EC form and the chip 10 with the SIO form is that the chip 10 with the SIO form has a specific circuit designed for implementing the computer system environment information monitoring module or other modules, whereas the computer system environment information monitoring module or other modules in the chip 10 with the EC form is implemented by storing a firmware to control the multipliers, the adders, the registers and the GPIOs (General Purpose I/O) in the chip 10 to perform the functions of the computer system environment information monitoring module or other modules. Though in FIG. 3 these modules are each shown as an individual block, part of the modules are not implemented by specific circuits but are implement by controlling the multipliers, the adders, the registers and the GPIOs. Consequently, the register mapping table 30 in the chip 10 is to make the registers in the chip 10 accessible. The EC interface 32 further provides a communication interface for the chips 10 to communicate with the data transmission interface 20 and the legacy 26. Through the control of the multipliers, the adders, the registers and the GPIOs, the chip 10 in the present embodiment can also be adapted in the computer system 1 and perform the functions described in the previous embodiment. In other embodiments, the kinds of chips other than EC and SIO may be adapted in the computer system 1 as well.

It's noticed that the computer system 1 can be an NO (all in one) form as depicted in FIG. 1. In other words, the chip 10, the display device 12 and the devices such as the BIOS 140, CPU 144 and memory 146 are formed on the same circuit board. The control connection interface 100 between the chip 10 (or control module 102 located in chip 10) and the OSD control module 122 can be formed on the circuit board directly.

Please refer to FIG. 4. FIG. 4 is the block diagram of the computer system 1 in another embodiment of the present

disclosure. In the present embodiment, the computer system 1 is a desktop computer or a notebook computer comprising a host 4. The chip 10 and the system and peripheral hardware devices are disposed in the host 4, whereas the display device 12 is independent of the host 4. Take the desktop computer for example, a communication wire is needed to form the display interface 161 between the display information processing module 160 and the display device 12. The control connection interface 100 between the chip 10 (or control module 102 located therein) and the OSD control module 122 can be integrated with the display interface 161 in the same communication wire to accomplish the bi-directional communication and control mechanism.

The advantage of the chip and the computer system of the present disclosure is that the chip is able to control the operation of the display panel by controlling the OSD control module through the connection between the chip and the OSD control module according to the computer system environment information.

Please refer to FIG. 5, an electronic system such as a computer system of one embodiment of the present disclosure is provided. FIG. 5 is a block diagram of the computer system 1 of an embodiment of the present disclosure.

The computer system 1 depicted in FIG. 5 is substantially the same as that depicted in FIG. 1. As a result, the chip 10 in FIG. 5 can also include the control module 102 as depicted in FIG. 2. Nevertheless, in the present embodiment, the control module 102 in the chip 10 is electrically connected to the system and peripheral hardware devices through interfaces such as, but not limited to low pin count (LPC) bus, network interface, peripheral component interconnect (PCI) bus, PCI express (PCIe) bus and universal serial bus (USB). For example, in an embodiment, the control module 102 is connected to the network module 148 through the network interface.

The network module 148 receives remote information 501 from a remote host (not shown) through a network. In an embodiment, the remote information 501 includes text information or graphical information. Moreover, in an embodiment, the text information or graphical information included in the remote information 501 is used for verification.

The control module 102 receives the remote information 501 from the network module 148 to control the OSD control module 122 through the control connection interface 100 accordingly to further control the display function of the display panel 120.

Please refer to FIG. 6 at the same time. FIG. 6 is a diagram of a first frame 600 and a second frame 602 displayed by the display panel 120 in an embodiment of the present disclosure. The second frame 602 is superimposed on the first frame 600.

In an embodiment, the information in both of the first frame 600 and the second frame 602 are received from a remote host through the network module 148, in which the first frame 600 is displayed by using the display information processing module 160 through the display interface 161, and the second frame 602 is displayed by using the control module 102 to control the OSD control module 122.

In the present embodiment, the first frame 600 includes the content of a web page and the second frame 602 includes the content of remote information 501 that includes the graphical verification information, in which the second frame 602 is superimposed on the first frame 600.

When the verification information is displayed by using the display information processing module 160 through the display interface 161, the hackers may intercept and decrypt the verification information to attack the remote host of the website. However, when the verification information is transmit-

ted and displayed by using the OSD control module 122, as illustrated in FIG. 6, the hackers are unable to identify the verification information since it is not included in the information of the web page.

As a result, the user can identify the verification information and input the input information 503 in response to the verification information in an input field 601 of the web page by using an input device such as the keyboard 154 to perform the verification. After the computer system 1 receives the input information 503 from the keyboard 154, the network module 148 transmits the input information 503 to the remote host through the network.

In an embodiment, the remote information 501 received by the network module 148 is in a non-plaintext form. The control module 102 can convert the remote information 501 from the non-plaintext form into a plaintext form according to a mapping table (not shown) and further controls the display panel 120 to display the content of the remote information in the plaintext form by controlling the OSD control module 122.

For example, the remote information 501 may include different combination of codes. The mapping table includes the mapping information to map the codes to graphical items such that the control module 102 controls the OSD control module 122 to display the graphical items on the display panel 120.

It is noted that in the embodiment described above, the graphical verification information is used as an example. In other embodiments, the content of the remote information 501 may include text verification information.

Please refer to FIG. 7. FIG. 7 is a diagram of a first frame 700 and a second frame 702 displayed by the display panel 120 in an embodiment of the present disclosure. The second frame 702 is superimposed on the first frame 700.

Similar to the embodiment depicted in FIG. 6, the information in both of the first frame 700 and the second frame 702 in the present embodiment are received from a remote host through the network module 148, in which the first frame 700 including the content of a web page is displayed by using the display information processing module 160 through the display interface 161, and the second frame 702 is displayed by using the control module 102 to control the OSD control module 122. However, in the present embodiment, the control module 102 of the chip 10 controls the display panel 120 to display a content of the remote information 501 and a mapping table 701 on the second frame 702.

Accordingly, the user can observe the mapping table 701 to input the input information 503 accordingly. For example, the mapping table 701 depicted in FIG. 7 maps the numbers from 1 to 6 to the numbers from 6 to 1. Therefore, when the code included in the remote information 501 is a combination of numbers "4523", the user can input the input information 503 including the combination of numbers "3254" to perform the verification.

Please refer to FIG. 8. FIG. 8 is a diagram of a first frame 800 and a second frame 802 displayed by the display panel 120 in an embodiment of the present disclosure. The first frame 800 is displayed by using the display information processing module 160 through the display interface 161, and the second frame 802 is displayed by using the control module 102 to control the OSD control module 122. The second frame 802 is superimposed on the first frame 800.

In an embodiment, the chip 10 and the network module 148 are kept active when the computer system 1 is in a power-off mode or a standby mode, such as in a S5 or S3 state defined by ACM (advanced configuration and power interface) standard.

Therefore, the first frame **800** is blank since the display information processing module **160** is in the power-off mode or the standby mode.

Under such a condition, when the network module **148** receives the remote information **501** from the remote host through the network, the chip **10** controls the OSD control module **122** to display the content of the remote information **501** on the second frame **802**. In an embodiment, the remote information **501** can be such as, but not limited to the message information of communication software.

FIG. **9** is a flow chart of a computer system operation method **900** in an embodiment of the present disclosure. The computer system operation method **900** can be used in the computer system **1**. The computer system operation method **900** includes the steps outlined below.

In step **901**, the remote information **501** is received from the remote host by the network module **148**.

In step **902**, the control module **102** electrically connected to the system and peripheral hardware devices can control the OSD control module **122** through a control connection interface **100** according to the remote information **501** to further control the display function of the display panel **120**.

In an embodiment, when the remote information **501** is only to be displayed on the display panel **120**, the flow ends after step **902** is performed.

In another embodiment, when the remote information **501** is a verification information that requires the user to send information back to the remote host, the input information **503** is received in response to the remote information **501** by the computer system through the input device, such as the keyboard **154** in step **903**.

In step **904** the input information **503** is subsequently transmitted to the remote host by the network module **148**.

Please refer to FIG. **10**. FIG. **10** is a block diagram of the computer system **1** of an embodiment of the present disclosure.

The computer system **1** depicted in FIG. **10** is substantially the same as that depicted in FIG. **1**. As a result, the chip **10** in FIG. **10** can also include the control module **102** as depicted in FIG. **2**. Nevertheless, in the present embodiment, the control module **102** in the chip **10** is electrically connected to the system and peripheral hardware devices through interfaces such as, but not limited to low pin count (LPC) bus, network interface, peripheral component interconnect (PCI) bus, PCI express (PCIe) bus and universal serial bus (USB). For example, in an embodiment, the control module **102** is connected to the keyboard **154** through the peripheral interface **150**.

The control module **102** receives the input information **1001** from the keyboard **154** to control the OSD control module **122** through the control connection interface **100** accordingly to further control the display function of the display panel **120**.

Please refer to FIG. **11**. FIG. **11** is a diagram of a first frame **1100** and a second frame **1102** displayed by the display panel **120** in an embodiment of the present disclosure. The first frame **1100** is displayed by using the display information processing module **160** through the display interface **161**, and the second frame **1102** is displayed by using the control module **102** to control the OSD control module **122**. The second frame **1102** is superimposed on the first frame **1100**.

In an embodiment, the chip **10** and the keyboard **154** are kept active when the computer system **1** is in a power-off mode or a standby mode, such as in a S5 or S3 state defined by ACPI standard. Therefore, the first frame **1100** is blank since the display information processing module **160** is in the power-off mode or the standby mode.

In the present embodiment, the computer system **1** can be equipped with a keyboard power-on mechanism. Under such a condition, when the chip **10** receives input information **1001** that includes the password to power-on the computer system **1** from the keyboard **154**, the chip **10** can control the OSD control module **122** to display the content of the input information **1001** on the second frame **1102**. In different embodiments, the input information **1001** is displayed either directly or in an implicit way by using the characters of indicate the number of the password.

Please refer to FIG. **12**. FIG. **12** is a flow chart of a computer system operation method **1200** in an embodiment of the present disclosure. The computer system operation method **1200** can be used in the computer system **1**. The computer system operation method **1200** includes the steps outlined below.

In step **1201**, the input information **1001** is received by the computer system through the input device, such as the keyboard **154**.

In step **1202**, the control module **102** electrically connected to the system and peripheral hardware devices can control the OSD control module **122** through a control connection interface **100** according to the input information **1001** to further control the display function of the display panel **120**.

In step **1203**, the computer system **1** is powered on according to the input information **1001**.

It will be apparent to those skilled in the art that various modifications and variations can be made to the structure of the present disclosure without departing from the scope or spirit of the disclosure. In view of the foregoing, it is intended that the present disclosure cover modifications and variations of this disclosure provided they fall within the scope of the following claims.

What is claimed is:

1. A computer system comprising:

a network module for receiving remote information from a remote host through a network;
an input device for receiving first input information;
a display device comprising:
a display panel; and
an OSD control module for controlling a display function of the display panel; and
a chip separate from the OSD control module, comprising:
a control connection interface electrically connected to the OSD control module for bi-directional communication; and

a control module electrically connected to the network module, the input device and the control connection interface to control the OSD control module through the control connection interface according to the remote information or the first input information to further control the display function of the display panel;

wherein a part of the remote information is a verification information, the control module converts the verification information by a first mapping table and displays the converted verification information by controlling the OSD control module or displays the verification information and the first mapping table at the same time by the OSD control module;

wherein the control module then converts the first input information according to the first mapping table and returns the converted first input information to the remote host.

2. The computer system of claim 1, wherein the remote information comprises text information or graphical information.

11

3. The computer system of claim 2, wherein the control module converts the remote information from a non-plaintext form into a plaintext form according to a second mapping table and further controls the display panel to display a content of the remote information in the plaintext form by controlling the OSD control module.

4. The computer system of claim 1, wherein the control module controls the display panel to display a content of the remote information and the first mapping table by controlling the OSD control module.

5. The computer system of claim 1, wherein the input device further receives second input information in response to the remote information such that the network module transmits the second input information to the remote host through the network.

6. The computer system of claim 1, wherein the control module controls the display panel to display a content of the first input information by controlling the OSD control module.

7. The computer system of claim 1, further comprising a display information processing module to control the display panel to display a first frame, wherein the control module control the OSD control module to control the display panel to display a second frame superimposed on the first frame.

8. The computer system of claim 1, wherein the chip and the network module are kept active when the computer system is operated in the power-off mode or a standby mode.

9. The computer system of claim 1, wherein the chip and the input device are kept active when the computer system is operated in the power-off mode or a standby mode, wherein the first input information is a password to power on the computer system; wherein the control module controls the display panel to display the first input information by controlling the OSD control module.

10. A method used in electronic system, comprising:
receiving remote information by a network module from a remote host through a network or receiving first input information by an input device, wherein a part of the remote information is a verification information;
controlling a OSD control module through a control connection interface electrically connected to the OSD control module for bi-directional communication by a control module electrically connected to network module and the input device according to the remote information or the first input information to further control a display function of a display panel;
converting the verification information by a first mapping table by the control module;
displaying the converted verification information by controlling the OSD control module or displaying the verification information and the first mapping table at the same time by the OSD control module by the control module; and
converting the first input information according to the first mapping table and returning the converted first input information to the remote host by the control module.

11. The method of claim 10, wherein the remote information comprises text information or graphical information.

12. The method of claim 11, further comprising:
converting the remote information from a non-plaintext form into a plaintext form by the control module according to a second mapping table; and
controlling the display panel to display a content of the remote information in the plaintext form by controlling the OSD control module by the control module.

12

13. The method of claim 11, further comprising receiving second input information in response to the remote information by the input device; and

transmitting the second input information to the remote host by the network module through the network.

14. The method of claim 10, further comprising:
controlling the display panel to display a content of the remote information and the first mapping table by controlling the OSD control module by the control module.

15. The method of claim 10, wherein the electronic system further comprise a display information processing module, wherein the method further comprises:

controlling the display panel to display a first frame by the display information processing module; and
controlling the OSD control module by the control module to control the display panel to display a second frame superimposed on the first frame.

16. The method of claim 10, wherein the control connection interface and the control module are comprised in a chip, the method further comprises:

keeping the chip and the network module active when the electronic system is operated in the power-off mode or a standby mode.

17. The method of claim 10, further comprising:
keeping the chip and the input module active when the electronic system is operated in the power-off mode or a standby mode;

controlling the display panel to display a content of the first input information by controlling the OSD control module by the control module; and
powering on the electronic system according to a password comprised in the first input information.

18. A chip separate from an OSD control module and adapted in an electronic system, comprising:

a control connection interface electrically connected to the OSD control module for bi-directional communication; and

a control module electrically connected to a network module and an input device, for receiving remote information from a remote host through the network module, and receiving first input information through the input device, wherein the control module control the OSD control module through the control connection interface according to the remote information or the first input information to further control the display function of a display panel;

wherein a part of the remote information is a verification information, the control module converts the verification information by a mapping table and displays the converted verification information by controlling the OSD control module or displays the verification information and the mapping table at the same time by the OSD control module;

wherein the control module then converts the first input information according to the mapping table and returns the converted first input information to the remote host.

19. The chip of claim 18, wherein the control module controls the OSD control module to display a second frame superimposed on a first frame.

20. The chip of claim 18, wherein the control module controls the display panel to display a content of the remote information by controlling the OSD control module.

21. The chip of claim 18, wherein the chip and the input device are kept active when the electronic system is operated in the power-off mode or a standby mode, wherein the first input information is a password to power on the electronic

13

system, wherein the control module controls the display panel to display the first input information by controlling the OSD control module.

22. A computer system comprising:
- a network module for receiving remote information from a remote host through a network;
 - an input device for receiving first input information;
 - a display device comprising:
 - a display panel; and
 - an OSD control module for controlling a display function of the display panel; and
 - a chip comprising:
 - a control connection interface electrically connected to the OSD control module; and
 - a control module electrically connected to the network module, the input device and the control connection interface to control the OSD control module through the control connection interface according, to the remote

14

information or the first input information to further control the display function of the display panel;
wherein the control module is configured to convert the remote information from a non-plaintext form into a plaintext form according to a mapping table and further controls the display panel to display a content of the remote information in the plaintext form by controlling the OSD control module;
wherein a part of the remote information is a verification information, the control module converts the verification information by a mapping table and displays the converted verification information by controlling the OSD control module or displays the verification information and the mapping table at the same time by the OSD control module;
wherein the control module then converts the first input information according to the mapping table and returns the converted first input information to the remote host.

* * * * *